A Scalable Discontinuous Galerkin Atmospheric Dynamical Core

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- ## Project Overview

  - **Objective** is to develop a scalable conservative dynamical core for the Community Climate System Model (CCSM) that addresses atmospheric transport issues such as mass conservation and monotonicity preservation.

  - **Building blocks** are the High-Order Method Modeling Environment (HOMME), conservative discontinuous Galerkin (DG) method implemented in HOMME framework, and the vertical Lagrangian coordinate scheme.

  - **Targeting** large-scale parallelism - $\mathcal{O}(100K)$ processors

- ## The DG Baroclinic Model:

  - High-order nodal DG horizontal discretization.

  - Vertical Lagrangian coordinates (conservative remapping).

  - Preliminary results for the baroclinic instability test of Jablonowski & Williamson.

  - Untuned version exhibits good performance results up to 1024 processors.

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